

**Do Now**

**Translate the following sentences into an expression or an equation. Use "n" as your variable.**

1) Three times a number.	2) 4 less than a number is 16	3) Eight subtracted from five times a number.
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**Use the distributive property to simplify the following.**

4) $3(x + 5)$	5) $-7(y + 12)$	6) $-5(-3x - 8)$
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**Lesson #55 - Factoring with GCF**

**Prior Knowledge Vocab:**

- A factor is a number that is multiplied by another number to get a product.
- Greatest Common Factor (GCF) is the largest factor two numbers have in common.

How can we write 6 as the product of two factors? 2 · 3

Example 1) Rewrite  $5x + 10$  as the product of two factors.

GCF:  $\overline{5}$      $\overline{5}$      $\overline{5}$      $5(x + 2)$      $5x + 10$

Example 2) Factor the expression  $8n - 12$  to its simplest form.

GCF:  $\overline{4}$      $\overline{4}$      $\overline{4}$

$4(2n - 3)$

Example 3) Factor the expression  $12 + 20y$  to its simplest form.

GCF: 4


$\overline{4} \overline{4}$

$$4(3+5y)$$

**Now, You Try! Factor the following to their simplest forms.**

4) $2x + 2$ $2(x+1)$	5) $5x - 15$ GCF: 5 $5(x-3)$
6) $9 + 3x$ $3(3+x)$	7) $16 - 4x$ $4(4-x)$

**On Your Own. Factor the following to their simplest forms.**

8) $4x - 16$ $\overline{4} \overline{4}$ $4(x-4)$	9) $3x + 18$ $3(x+6)$
10) $16x + 12$ $4(4x+3)$ 	11) $20x - 15$ $\overline{5} \overline{5}$ $5(4x-3)$
12) $8x - 10 + 2y$ $2(4x-5+y)$	13) $5x - 10y + 25$ $5(x-2y+5)$
14) $12x^2 + 8x - 16$ $4(3x^2+2x-4)$	15) $9xy + 6x - 18y + 12$ GCF: 3 $\overline{3} \overline{3} \overline{3} \overline{3}$ $3(3xy+2x-6y+4)$

**A GCF can also have a variable in it.**

Example 16) Factor the following expression:  $\frac{5x^2}{5x} + \frac{10x}{5x}$   
 GCF:  $5x$

$$5x(x + 2)$$

Example 17) Factor the following expression:  $\frac{16x^3}{4x} + \frac{12x^2}{4x} - \frac{8x}{4x}$   
 GCF:  $4x$

$$4x(4x^2 + 3x - 2)$$

**Now, You Try!** Factor the following using a GCF.

18) $\frac{20x^6}{5x^2} + \frac{15x^2}{5x^2}$ GCF: $5x^2$ $5x^2(4x^4 + 3)$	19) $\frac{36y^7}{6y} - \frac{12y^3}{6y} - \frac{6y}{6y}$ GCF: $6y$ $6y(6y^6 - 2y^2 - 1)$
20) $100z^9 + 50z^6 - 75z^5$ GCF: $25z^5$ $25z^5(4z^4 + 2z - 3)$	21) $\frac{70x^5}{7} - \frac{49x^2}{7} + \frac{35}{7}$ GCF: $7$ $7(10x^5 - 7x^2 + 5)$